What is claimed is:

5   1.   A method for transmitting data elements (DATA) from a transmitter (TX) to a
receiver (RX), wherein

    a.   said data elements (DATA) modulate at least one carrier;

    b.   a pilot carrier used for synchronisation between said transmitter (TX) and said
receiver (RX) is multiplexed with said at least one carrier;

10   c.   said at least one carrier and said pilot carrier are transmitted over a
transmission medium (TM) interconnecting said transmitter (TX) and said
receiver (RX),

characterized in that said pilot carrier is modulated with a non-constant signal
before it is transmitted so as to produce a pilot carrier having a sine or cosine
15   waveform with non-constant phase and/or amplitude wherein said non-
constant signal consists of part of said data elements (DATA) to be transmitted
for enlarging bandwidth for transport of said data elements, and

    d.   said part of said data elements is sufficiently random in time thereby
improving immunity of said pilot carrier to interference.

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Rule (126) 7.   A transmitter (TX), adapted to transmit data elements (DATA) to a receiver
(RX) via a transmission medium (TM), said transmitter (TX) comprising:

    a.   modulation means (MOD) to a first input of which said data elements (DATA)
are applied, said modulation means (MOD) being adapted to modulate said
25   data elements (DATA) on at least one carrier, and to multiplex said at least
one carrier with a pilot carrier used for synchronisation between said
transmitter (TX) and said receiver (RX); and

    b.   line interface means (TI), coupled between an output of said modulation
means (MOD) and an input of said transmission medium (TM), and adapted to
30   condition said at least one carrier and said pilot carrier to be transmitted over
said transmission medium (TM), characterised in that said modulation means
(MOD) is further adapted to modulate said pilot carrier with a non-constant

signal so as to produce a pilot carrier having a sine or cosine waveform with non-constant phase and/or amplitude wherein said non-constant signal consists of part of said data elements (DATA) to be transmitted for enlarging bandwidth for transport of said data elements, and said part of said data elements is sufficiently random in time thereby improving immunity of said pilot carrier to interference.

8.   A receiver (RX), adapted to receive a signal (S') transmitted thereto by a transmitter (TX) via a transmission medium (TM), said receiver (RX) comprising:

a.   line interface means (RI), coupled to an output of said transmission medium (TM) and adapted to condition said signal (S') to be applied to components of said receiver (RX); and

b.   demodulating means (DMOD), an input of which is coupled to an output of said line interface means (RI), said demodulating means (DMOD) being adapted to demultiplex in said signal (S') a pilot carrier from at least one carrier modulated with data elements (DATA'), and to demodulate said data elements (DATA') from said at least one carrier, characterised in that said pilot carrier is modulated with a non-constant signal so as to produce a sine or cosine waveform with non-constant phase and/or amplitude wherein said non-constant signal consists of part of said data elements (DATA) to be transmitted for enlarging bandwidth for transport of said data elements, wherein said part of said data elements is sufficiently random in time thereby improving immunity of said pilot carrier to interference, and said demodulating means (DMOD) further is adapted to demodulate the non-constant signal from said pilot carrier and to use the demodulated pilot carrier for synchronisation.